

1 Attorney Docket No. 84454

2

3 OPTICAL FIBER COUPLER

4 The present invention is a continuation-in-part of U.S.
5 Application ^{10/251,693} _{10/231,693}, filed 17 September 2002, in the names of
6 Lynn T. Antonelli and Patrick J. Monahan.

7

8 STATEMENT OF GOVERNMENT INTEREST

9 The invention described herein may be manufactured and used
10 by or for the Government of the United States of America for
11 Governmental purposes without the payment of any royalties
12 thereon or therefor.

13

14 BACKGROUND OF THE INVENTION

15 (1) Field of the Invention

16 The invention relates to fiber optic elements and is
17 directed more particularly to an optical fiber coupler wherein
18 fiber optic elements are coupled so as to provide a physical and
19 optical connection therebetween.

20 (2) Description of the Prior Art

21 Fiber optic strands typically include a central region in
22 which light propagates, a cladding region to contain the light
23 within the central region, and customarily a protective jacket.
24 It is generally known to consolidate light carried in a group of
25 fiber optic strands into a single strand, and, conversely, to

1 element. However, in the case of fiber optic elements 40 and 50
2 each consisting of a single fiber optic element, the free ends
3 44, 52 may be spaced as close as is practical.

4 Light exiting either the first or second fiber optic
5 elements 40, 50 is propagated out of the appropriate strand end
6 or ends 44, 52. Light exiting the selected element is
7 transported through the cured optically transparent resin 60
8 towards the receiving fiber optic element.

9 The coupler described hereinabove provides a connection
10 which allows light to be coupled from a group of optical fiber
11 strands into a single strand or several other strands, or from a
12 single strand into another single strand or into a plurality of
13 strands. Further, it is to be understood that an n-by-n coupler
14 may be provided. The first and second fiber optic elements 40
15 and 50 in an n-by-n coupler each comprise a plurality of strands.

16 Such n-by-n couplers find utility in linear arrays of pulse
17 responsive, 2-mode, in-line within a fiber, Fabry-Perot
18 interference cavity sensors, which are disclosed in U.S. Patent
19 Application Serial Number 06/795,843, filed ⁴ ₅ September 1985, by
J.D. ^{now U.S. Patent 6,515,939,}
02/08/07 ₁
20 Eugene Green et al, entitled "Pulse Sample Optical Fiber
21 Hydrophone Array". In the type of hydrophone array systems which
22 employ pulse-responsive, 2-mode, interference cavity fiber
23 sensors as their individual hydrophone elements, one of the
24 strands of first fiber optic element 40 propagates pulses to a
25 plurality of strings of fiber sensors connected to respective